

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ  
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ  
КАФЕДРА ІНОЗЕМНИХ МОВ  
ЛІНГВІСТИЧНИЙ НАВЧАЛЬНО-МЕТОДИЧНИЙ  
ЦЕНТР**

**МАТЕРІАЛИ  
Х ВСЕУКРАЇНСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ  
КОНФЕРЕНЦІЇ СТУДЕНТІВ, АСПІРАНТІВ ТА  
ВИКЛАДАЧІВ  
ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО  
ЦЕНТРУ КАФЕДРИ ІНОЗЕМНИХ МОВ**

**“WITH FOREIGN LANGUAGES TO MUTUAL  
UNDERSTANDING, BETTER TECHNOLOGIES AND  
ECOLOGICALLY SAFER ENVIRONMENT”**

**(Суми, 24 березня 2016 року)  
The tenth all Ukrainian scientific practical student`s,  
postgraduate`s and teacher`s conference**

## HYDRAULICS IN MEDICINE

M. Lytvynenko – Sumy State University, group EM-51

I.O. Zaitseva – EL Adviser

I am really interested in major laws and aspects of hydraulics. I would like to investigate the usage of hydraulics in medicine. After having learnt about the application of artificial lungs airing machine (aids ventilation) and diaphragm compressors, I have seen the importance of hydraulics in medicine. But I am just a beginner, so it's so difficult for me to concretize the exact sphere of my future research. I hope I will define it during the first two years of study at our university.

I would like to tell about a peristaltic pump, type of a pump used for pumping a variety of fluids. The advantage of using this mechanism is that it has contamination, because the only part of the pump in contact with the fluid being pumped is the interior of the tube, it is easy to sterilize and clean the inside surfaces of the pump. It needs the low maintenance, its lack of valves, seals and glands makes it comparatively inexpensive to maintain. It is able to handle slurries, viscous, shear-sensitive and aggressive fluids. Pump design prevents backflow and syphoning without valves. Typical applications:

- Medicine
- Dialysis machines
- Open-heartbypass pumpmachines
- Medicalinfusionpumps
- Testing and research
- AutoAnalyzer
- Analyticalchemistry experiments
- Carbonmonoxide monitors
- Mediadispenders
- Chemicalhandling

- Printing, paint and pigments
- Pharmaceutical production
- Dosing systems for dishwasher and laundry chemicals
- Water and Waste
- Chemical treatment in water purification plant
- Sewage sludge
- Aquariums, particularly calcium reactors

Another very important thing in medicine is a hydraulic scalpel - liquid jet scalpel, which does not damage the vascular system for operations on internal organs. High pressure at the unit removes muscle tissue with minimal blood loss. Such a device has two scalpels - the larger and smaller diameter for different kinds of fabrics. The device has the weight about 70 kilograms and works without a power supply and can be easily transported. Externally, the device is similar to the drill, from which flows under high pressure thin stream of water from a syringe. This knife can be used many times in the treatment of abscesses in surgery. It does not destroy the organ. In addition, hydraulic scalpel is successfully used by gynecologists, urologists, surgeons. Thanks to a new method the manipulation takes half of the time. Under the influence of a high pressure it is separated tissue with little or no damage to the vascular system, that is with minimal blood loss. This allows not only to reduce the duration and invasiveness of surgical interventions, but also significantly reduce the period of postoperative rehabilitation of patients.